



5th Management Plan Turf Section comments
6/9/2020

The Town of Gilbert appreciates being able to review and comment on the proposed regulations for the forthcoming 5th Management Plan for large turf facilities. Irrigation water represents a significant consumptive use and ensuring the water is managed properly is of the utmost importance.

As the discussion proceeds, where will all of the comments be posted so they can be reviewed?

Comments from slides at the last meeting:

One of the stated goals was to simplify the program, both for the Department of Water Resources and for the site managers. It appears that classifications of different irrigated areas was done only in the Phoenix Active Management Area. Why was this done initially? There are many different irrigated area classifications: planted acres, additional turf acres, historic turf not in planted acres, low water use, additional low water use, and historic low water use not in planted areas. If the goal to simplify the program is to remove these classifications how will this be handled? What is the expected impact to sites within the Phoenix AMA that relied on the allotments for these other classifications?

The classifications for golf courses in the Phoenix AMA between regulation and non-regulation courses was based on the distance from the first tee to the last green in yards. With regulation courses being longer, and therefore often likely containing more turf acres per hole, what is the expected impact to the sites that relied on the past allocations? What are some of the possible mitigations that they could employ to comply with the new allotments? Without course specific examples, it is difficult to ascertain if the new allotments are achievable in the field.

With only one large turf facility in the Phoenix AMA that is larger than 90 acres, restricting future developments to less than that size appears to have less impact than we would recommend. If the current site was in compliance in previous management plans then the site will be grandfathered in under any new restrictions. In order to have a meaningful impact on the water needs of future developments alternative methods may be more effective in achieving the goal of saving water. One such option would be to place restrictions on the amount of water intensive landscape as a percentage. Another possible method would be to assign a water allocation for the landscape area at the site where the designer would determine the amount of water intensive landscape that would still comply with the regulation.

One of the slides in the presentation mentioned water surface areas. Are possible limitations on water surface areas being considered? Sites that receive reclaimed water from utilities often have ordinances that require a certain amount of onsite storage so they do not overwhelm the municipal provider's distribution system. This also allows for them to maintain a supply of water in the event of a disruption in service from the utility. If this is incorporated the only way for them to comply with both requirements would be to have the onsite storage areas deeper which may be a safety factor.



Application rates:

We have asked for the source data used by ADWR to determine the turf water needs and have not received them. Is there any plan to release that source data?

The following turf water needs per acre are calculated using the information from the University of Arizona Turfgrass Research Center publications AZ1195-214 and AZ1314. Additional reference is from the Irrigation Association Best Management Practices and from the Irrigation Association Landscape Irrigation Auditor manual 3rd Edition.

All of the following calculations are based on a 77% Distribution Uniformity of the irrigation systems. All turf acreage is assumed to be overseeded.

It is important to note that there is a spectrum of turf quality based on the use of the turf and therefore the water demands across the spectrum is also quite different. High traffic and high visibility areas, such as golf course tees, approaches and greens have a higher water need than ornamental turf areas. This is shown in the following table

Type of Turf	Turf Quality			
	Golf Greens ¹	Athletic Fields ²	Good Quality ³	Minimum ⁴
Bermudagrass	0.80	0.70	0.60	0.50
Overseeded Ryegrass	0.83	0.75	0.68	0.60

¹: Highest quality golf and sports turf irrigated daily

²: High quality golf and sports turf

³: Acceptable quality ornamental turf

⁴: Stressed turf, marginal turf quality

For golf courses a method would need to be developed that would take into consideration the differing water needs of the types of turf areas. From there setting a reasonable allocation allowing for all of the types of turf areas within the course.



For high quality athletic turf in high traffic areas such as golf course tees and greens at an 80% Crop Coefficient the water demand calculates to be 5.8 AF/Acre. It is important to recognize that these components of the play areas represent a small percentage of the entire turf on a golf course.

Water Budget Estimate at 77% DU at .8 Kc

	SQ. FT.	1 acre =43,560 sq.ft.						
Turf	43,560							
Desert landscape	0	Density	1.00					
High Water Use	0	Density	1.00					
	ETo	Kc	Turf Budget	Kc	Desert	Kc	High	
Month	(Inches)	Turf	K Gals	Desert	K Gals	Water	Budget	Total Gallons
January	2.43	0.8	61	0.3	0	0.8	0	61
February	3.26	0.8	82	0.3	0	0.8	0	82
March	5.33	0.8	134	0.3	0	0.8	0	134
April	7.67	0.8	193	0.3	0	0.8	0	193
May	9.57	0.8	241	0.3	0	0.8	0	241
June	10.2	0.8	257	0.3	0	0.8	0	257
July	9.81	0.8	247	0.3	0	0.8	0	247
August	8.75	0.8	220	0.3	0	0.8	0	220
September	7.14	0.8	180	0.3	0	0.8	0	180
October*	5.28	0.85	141	0.3	0	0.8	0	141
November	3.11	0.8	78	0.3	0	0.8	0	78
December	2.2	0.8	55	0.3	0	0.8	0	55
	74.75		1,891		0		0	1,891
ETo = Evapotranspiration rate determined by weather data							AF	5.80
Kc = The percentage of the ET that landscape plants or turf use								
K Gals = 1000 gallons								
* overseed with winter rye								



For other turf areas that still have a high amount of traffic but less than the tees and greens, such as fairways, with a crop coefficient of 70% the water demand calculates to 5.11 AF/Acre. These turf areas account for a large portion of the turf acreage at a golf course.

Water Budget Estimate at 77% DU at .7 Kc

	SQ. FT.	1 acre =43,560 sq.ft.	
Turf	43,560		
Desert landscape	0	Density	1.00
High Water Use	0	Density	1.00

	ETo	Kc	Turf Budget	Kc	Desert	Kc	High	
Month	(Inches)	Turf	K Gals	Desert	K Gals	Water	Budget	Total Gallons
							K Gals	K Gals
January	2.43	0.7	54	0.3	0	0.8	0	54
February	3.26	0.7	72	0.3	0	0.8	0	72
March	5.33	0.7	117	0.3	0	0.8	0	117
April	7.67	0.7	169	0.3	0	0.8	0	169
May	9.57	0.7	211	0.3	0	0.8	0	211
June	10.2	0.7	225	0.3	0	0.8	0	225
July	9.81	0.7	216	0.3	0	0.8	0	216
August	8.75	0.7	193	0.3	0	0.8	0	193
September	7.14	0.7	157	0.3	0	0.8	0	157
October*	5.28	0.8	133	0.3	0	0.8	0	133
November	3.11	0.7	69	0.3	0	0.8	0	69
December	2.2	0.7	48	0.3	0	0.8	0	48
	74.75		1,664		0		0	1,664

ETo = Evapotranspiration rate determined by weather data
 Kc = The percentage of the ET that landscape plants or turf use
 K Gals = 1000 gallons
 * overseed with winter rye



For ornamental turf other than athletic play areas at golf courses or any other ornamental turf at commercial or common area landscaping at housing communities with a crop coefficient of 60% the water demand calculates to 4.43 AF/Acre.

Water Budget Estimate at 77% DU at .6 Kc

	SQ. FT.	1 acre =43,560 sq.ft.						
Turf	43,560							
Desert landscape	43,560	Density	0.40					
High Water Use	0	Density	1.00					

Month	ETo (Inches)	Kc Turf	Turf Budget K Gals	Kc Desert	Desert Budget K Gals	Kc High Water	High Budget K Gals	Total Gallons K Gals
January	2.43	0.6	46	0.3	9	0.8	0	55
February	3.26	0.6	62	0.3	12	0.8	0	74
March	5.33	0.6	101	0.3	20	0.8	0	120
April	7.67	0.6	145	0.3	28	0.8	0	173
May	9.57	0.6	181	0.3	36	0.8	0	216
June	10.2	0.6	193	0.3	38	0.8	0	231
July	9.81	0.6	185	0.3	36	0.8	0	222
August	8.75	0.6	165	0.3	32	0.8	0	198
September	7.14	0.6	135	0.3	27	0.8	0	161
October*	5.28	0.8	133	0.3	20	0.8	0	153
November	3.11	0.6	59	0.3	12	0.8	0	70
December	2.2	0.6	42	0.3	8	0.8	0	50
	74.75		1,445		278		0	1,723

ETo = Evapotranspiration rate determined by weather data	Turf AF	4.43
Kc = The percentage of the ET that landscape plants or turf use	Desert AF	0.85
K Gals = 1000 gallons		
* overseed with winter rye		

For low water use planted areas with a crop coefficient of 30% and 40% of the area covered in plant canopy the water demand calculates to be 0.85 AF/Acre.

What is the intended allocation for large turf facilities that are not golf courses and typically ornamental turf areas?



Other comments:

The definition of a large turf facility has always been a site that has 10 acres or more of water intensive landscape. There are a tremendous amount of landscape areas within the AMA that are below the 10 acre limit. Town of Gilbert water consumption data shows that smaller sites have a higher percentage of excess water applied than the larger sites. Reducing the 10 acre limit would capture more of the sites and could achieve a higher water savings potential. There are many sites that have less than 10 acres of water intensive landscape but are still very large landscapes. Another option may be to keep the limit at 10 acres or more of water intensive landscape and also include any sites with XX numbers of acres of total landscape.

The allowance of more water for sites that are using reclaimed water is important due to the water quality and how it interacts with our desert soils. Currently the extra allotment for sites using reclaimed water is 40%. How was this extra allotment derived?

Under certain conditions because of the water quality and our desert soils the salinity in the root zones builds up until turfgrass can no longer be supported. The common way to reduce the salinity levels is to push it below the root zones with increased applications of water known as leaching. Currently the allowance for extra allocations for this purpose is based on the water quality and not the actual soil salinity. We would recommend reviewing how this allotment is calculated.

Thank you for receiving these comments and we look forward to continuing to participate in this process to ensure an effective large turf facility program.

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